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FEDERAL COMMUNICATIONS COMMISSION
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Larry Strickling
Chief
Common Carrier Bureau
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

August 9, 1999

Re: CC Docket No. 96-98 and CC Docket No. 95-185

Dear Mr. Strickling:

On August 4, 1999, representatives from MCI WorldCom, Inc. met with you and several individuals from the Common Carrier Bureau to discuss the imposition of a Commission mandate requiring incumbent local exchange carriers ("ILECs") to provide new entrants with unbundled local switching. During that meeting, the Commission staff requested that MCI WorldCom address a proposal presented by the Bell Operating Companies ("BOCs") and GTE limiting access to unbundled switching for business customers. In addition, the Commission staff requested that MCI WorldCom provide data concerning geographic markets and the manner in which CLECs generally deploy switches in differently-sized markets. To that end, MCI WorldCom submits the following analysis and attached documentation for consideration by the Commission.

MCI WorldCom's objective is simple -- to ensure that as many business customers in as many locations as possible have the opportunity and competitive benefits from choosing among multiple service providers. We believe that any restriction on access to unbundled local switching will place this objective at risk. In addition, we are concerned that any exception crafted by the Commission inevitably will create "winners" and "losers" among the CLECs, depending on how their individual business plans are affected by the exception.

The existence of a CLEC switch in a particular location does not demonstrate that it is generally feasible for other CLECs to serve that location because CLECs have unique business plans and unique sets/locations of existing customers. A CLEC that is focusing on a regional presence may pursue a market strategy that would not be justified under a global or national business plan. Moreover, a pure data CLEC may deploy switches not intended for voice traffic. Should the Commission nevertheless decide to impose some restriction on access to unbundled switching for business customers, it should carefully review data that could shed light on which

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limitation would least hamper business customers' ability to have to multiple providers for local services. MCI WorldCom provides some data to help the Commission.

General Considerations:

- Switching is the network element that most allows local exchange providers to differentiate their products. New entrants will have the incentive to deploy switches wherever it is economically feasible to do so, (i.e., wherever projected demand is sufficient to justify the investment, subject to that entrant's capital budget constraints and business plan).

- This incentive is made even stronger by the trend in the business market toward multi-location customers who seek the same service capability in all their locations. Not infrequently, these include locations in the business districts of second- and third-tier cities or away from the core business districts of a large MSA.

- Dependence upon unbundled ILEC switching in locations where a CLEC does not have a switch is a distinctly second-best solution that nonetheless is necessary because it is not possible or cost effective for any new entrant to deploy switches ubiquitously. To attract even the largest business customer in the most concentrated part of the market, it is becoming increasingly necessary to use ILEC switching to service satellite offices. Thus, a Commission rule that artificially cuts off access to ILEC switching in a small or mid-sized markets threatens CLECs' abilities to attract business customers in all markets.

- In its filing in support of its proposed merger with Ameritech, SBC described its Nationwide Out-of-Region Strategy to deploy switches within three years. SBC explains why a global or national provider must be able to offer service in many geographic markets to be competitive, "to create a ...company able to follow and serve its customers everywhere."

    - "it is critical [to enter 30 new markets quickly] to serve the needs of the large and mid-size business customers that will form the base or "anchor" for the entry and establish "first mover advantages."

    - "It will use a "smart build" strategy by which it will construct the facilities that are most needed, combine them with unbundled elements purchased from the incumbent LEC and, where appropriate, transport networks owned by third parties."

- Wholesale switching markets are extremely unlikely to develop due to CLECs' desire to differentiate their product offerings by self-provisioning their own switching capability wherever feasible. Nor are CLECs that put in unique switching capability likely to want to make that capability available to competitors. Wholesale switching markets will be thin at

best. A key factor to consider in developing a bright-line rule would be whether CLECs could self-provision switching in areas leasing is not required.

Preconditions to Any Restrictions on Right to Lease:

- If the Commission were to carve out exceptions to the requirement that ILECs provide unbundled network switching, then at the least:
  - a combination of loop, multiplexing, and dedicated transport (i.e., extended loop) must be available, at state approved TELRIC prices, that does not require collocation or other CLEC activity to combine, with no restrictions on use;
  - collocation must be available pursuant to state approved tariffs that comply with the FCC's cageless collocation order in CC 98-147;
  - multiplexing must be available sufficient to use every loop as if it were home-run carrier serving area ("CSA") copper; and
  - it must be possible to perform hot cuts of loops over to CLEC switches efficiently — at the DS-1 level and higher.

Switching Deployment in Differently-Sized Markets

- The decision by a CLEC to deploy a switch is based on potential traffic in geographic areas more expansive than the individual serving wire center or central office. The more relevant geographic area is the MSA[1] or county.
- Given the ILECs' inability to perform efficient hot cutovers of large numbers of unbundled loops, currently CLECs can only use their own switches for the provision of service to business — vs. mass markets — customers. The decision to deploy a switch therefore will depend primarily on potential business demand in a market — as measured by the total number of business lines. (Individual CLEC decisions also will depend on the location of the CLEC's existing customer base and facilities, but these variables cannot be incorporated into any regulatory rule beyond the recognition that no CLEC will have the financial ability to deploy switches ubiquitously.)
- As shown statistically in Attachment A, the economics of switch deployment in larger

[1] It is important to distinguish between MSAs and Consolidated Metropolitan Statistical Areas (CMSAs), which are much broader. CMSAs cover an entire megalopolis — e.g., the New York CMSA extends from Trenton, NJ, to Danbury, CT, and to Suffolk County, NY. These stretches are far beyond the efficient reach of a switch. By contrast, most areas within MSAs can be served reasonably efficiently by a centrally located switch and extended link priced at TELRIC.

markets is different from the economics of switch deployment in smaller markets. The structural shift occurs at about the 30th largest market ranked by total number of business lines.

- Table 2 ranks MSAs in descending order based on the total number of business lines in the MSA (as calculated by the HAI model.)

    - CLEC business plans generally are not premised on capturing more than 10 percent market share.

    - As explained in MCI WorldCom's comments, in the Declaration of Mark T. Bryant, Ph.D., there are substantial diseconomies associated with operating a switch at low capacity. Thus the economics of switch deployment are based on some expectation that when the projected market share is attained traffic will be sufficient to operate the switch efficiently. Thus, for example, it is reasonable for a CLEC to expect to be able to attain 40,000 business lines in order to be able to operate efficiently.

    - Reviewing the MSA data on business lines, today there are 29 MSAs with 400,000 or more business lines. Indeed, the break between the 29th and 30th MSA is fairly substantial — 43,000 lines or a greater than 10 percent drop off between #29 Tampa and #30 Sacramento.

Size of Serving Wire Center

- Making exceptions for large serving wire centers would effectively exclude many CLECs from providing service in many locations (where they do not have switches); this is most likely to impact business customers in middle-sized cities, and in turn would impair CLECs' abilities to compete for the larger city locations of multi-location customers.

Number of Collocators

- Basing exceptions on the number of collocations creates uncertainty in CLEC business plans as actions outside their control and impossible to know in advance could result in denial of access to switching; moreover, there is no nexus between the number of collocations and alternative switching options.

Special Access Pricing Zones

- The ILECs have proposed excepting them from providing unbundled switching in the central offices in their Special Access Price Zones 1 and 2. Such restrictions would deny CLECs access to switching in the business districts in many second and third tier cities. As shown in Table 1, which provides data on Zone 1 central offices located in cities

outside the largest 25 MSAs, denying CLECs access to unbundled switching in Zone 1 central offices would deny them access to switching in a large number of medium-sized cities as well as a number of "second 25" cities.

- The Zones are in any event a bad choice for any bright line rule. The Commission's rules under which ILECs define zone boundaries give the ILECs vast discretion to set zone boundaries. In authorizing ILECs to define zone boundaries, the Commission required only that "LECs are to make a showing that the assignment of central offices to each of the zones reflects cost-related characteristics, such as traffic density or some measure of traffic through each office. Geographic contiguity may also be considered in order to reflect exchange area boundaries or communities of interest, but should be a less important factor." Report and Order and Notice of Proposed Rulemaking, In the Matter of Expanded Interconnection with Local Tel. Co. Facilities, 7 F.C.C.R. 7369, ¶ 179 (1992) ("Expanded Interconnection Order"); 47 C.F.R. § 61.38(b)(4).

- The Commission evaluates zone density pricing plans under a lax "reasonableness" standard. See Order, In the Matter of GTE Service Corp. Revised Zone Density Pricing Plan, 10 F.C.C.R. 5696, ¶ 7 (1995). The reasonableness standard is not difficult for ILECs to meet: MCI WorldCom is not aware of any zone density plans which the Commission has found unreasonable.

- In particular there is a three step procedure under which ILECs assign central offices to zones within a given study area, resulting in an almost arbitrary designation of zones.[2] See Order, In the Matter of Bell South Telecom., Inc., 8 F.C.C.R. 4443, ¶ 5 (1993).

    - In the first step, an ILEC ranks its wire centers in order of decreasing traffic density, based on some measure of density chosen by the ILEC.

    - In the second step, the ILEC sets breakpoints within the zone density rankings to partition the wire centers into zones.

    - In the third step, an ILEC further adjusts the zones as it sees fit, based on geographic contiguity or community of interest reasons.

- This three-step process leaves the ILECs with sweeping discretion to define zone boundaries. In the first step, the ILECs have discretion to choose how to measure traffic density, and this determination will affect the ranking of the wire centers. For example, ILECs have ranked densities based on both interstate traffic and total traffic, and the Commission has refused to require ILECs to adopt a single methodology. See Bell South

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[2]Although there are exceptions, a study area is generally a telephone company's operating territory within a state. See Order, In the Matter of Bell South Telecom., Inc., 8 F.C.C.R. 4443, ¶ 3 n.4 (1993).

Telecom., Inc., 8 F.C.C.R. 4443 at ¶¶ 6, 12. Additionally, in the third step, the ILECs may arbitrarily shuffle wire centers among zones, provided they have some justification based on geography or communities of interest.

- Most importantly, the ILECs have the greatest discretion in the second step of the zoning process: setting breakpoints. There is no FCC rule or standard governing how breakpoints are established and thus how zones are defined. Indeed, the Commission has acknowledged that "central office rankings show that no clear breakpoints exist. . . . [T]here is often a continuum of office densities, and several different breakpoints could reasonable be selected as the line between zones." Bell South Telecom., Inc., 8 F.C.C.R. 4443 at ¶¶ 18. The relative sizes of zones are thus entirely arbitrary and left to the discretion of the ILECs. Furthermore, under the zone density proposal for switching, the relative sizes of the zones is critical. If the ILECs set breakpoints to minimize the size of zones in which they need not offer switching as an unbundled network element, their obligation to provide switching will obviously be minimal.

- In addition, the Commission has just released an order eliminating one of the few constraints that had limited the ILECs' discretion to define zones. See Commission Adopts Flexibility and Other Access Charge Reforms, Report No. 99-33, 1999 W.L. 569081 (FCC Aug. 5, 1999). The Commission initially subjected ILECs seeking to establish more than three zones to increased scrutiny. See Expanded Interconnection Order at ¶ 179 n.413. However, the Commission now requires only that each zone except the highest-cost zone accounts for at least 15% of the ILEC's revenues in the study area. See Commission Adopts Flexibility and Other Access Charge Reforms, Report No. 99-33, 1999 W.L. 569081 (FCC Aug. 5, 1999). The Commission's order thus grants ILECs even greater flexibility to define the scope and number of zones.

- The ILECs' nearly complete discretion to set breakpoints demonstrates that the zones have no inherent economic or physical meaning and thus should not be used to determine when the ILECs must provide switching as an unbundled network elements.

    - In one case illustrating the arbitrary nature of zone boundaries, GTE in some states set breakpoints such that 55% of traffic was assigned to zone 1 wire centers, while in other states, GTE set breakpoints such that 33% of traffic was assigned to zone 1 wire centers. See GTE Service Corp. Revised Zone Density Pricing Plan, 10 F.C.C.R. 5696 at ¶ 5.

    - In another case, some ILECs set breakpoints based on "a fixed volume level." See Bell South Telecom., Inc., 8 F.C.C.R. 4443 at ¶ 7. Such a methodology is completely arbitrary: by manipulating the "fixed volume levels," an ILEC can produce zones of any size. For example, the "fixed volume levels" could be chosen such that 70% of traffic would be in zone 1, 15% in zone 2, and 15% is in zone 3.

- By defining such breakpoints, the LECs could limit arbitrarily their obligation to provide switching as an unbundled network element. These examples show that the zone classifications do not measure traffic density; instead, they reflect the state-by-state pricing strategies of the ILECs.

- The disparity among zone classifications nationwide would ensure that there would be no uniform national principle governing the provision of switching as an unbundled network element. ILECs have employed varying methodologies to set zone boundaries, and this fact alone ensures that a "zone 1" area in one state does not resemble a "zone 1" area in another state. In addition, because of differences among states in traffic density patterns, even a single methodology can produce dissimilar zone classifications in different states. For example, if each state were partitioned into three zones of equal traffic volume, a "zone 1" region in a rural state would likely have much less traffic than a "zone 1" region in a more urban state. The Commission should reject the zone density proposal because it will produce nonuniform nationwide results.

- The Commission should reject the zone density pricing plans because the ILECs can easily modify zones, leaving the ILECs' obligation to provide switching open to anti-competitive manipulation. Like the initial zoning plans, the Commission evaluates modifications of zoning plans under a "reasonableness" standard, see GTE Service Corp. Zone Density Pricing Plan, 10 F.C.C.R. 5696 at ¶ 7, and MCI WorldCom is not aware of any modifications being rejected as unreasonable.

- The ILECs' ability to revise zones would allow them to manipulate in at least two ways their obligation to provide switching as an unbundled network element.

  - First, the ILECs could redefine breakpoints to put more central offices into zones in which the ILECs were not required to provide switching as an unbundled network element. For example, an ILEC might choose to redefine the high-density zone to contain a greater fraction of the study area's total traffic. By increasing the size of the high-density zone, the ILEC would decrease its obligation to provide switching as an unbundled network element.

  - Second, even without changing breakpoints, ILECs could change their methodologies for defining zones to upset their competitors' business plans. Suppose, for example, that a CLEC planned to purchase switching as an unbundled network element in the location of a given central office. The ILEC could change its methodology for ranking central office traffic density in such a way that the central office changed zones, and the ILEC was no longer required to offer switching to CLECs. Alternatively, the ILEC could rely on its ability to redefine zones based on geography or communities of interest in order to reclassify the central office.

Should you have any questions, please feel free to contact me.

Sincerely,

Chuck Goldfarb
Director, Law and Public Policy

cc: Robert Atkinson
Carol Mattey
Jake Jennings
Claudia Fox
Chris Libertelli
Jordan Goldstein
Deena Shetler

ATTACHMENT A

Switch deployment depends critically on the size of the market due to both demand-side and supply-side factors. Typically, larger markets (measured by lines or traffic) offer CLECs greater opportunities to reach the critical customer mass required for switch deployment and thus will support more switches. Therefore, the deployment of CLEC switches will be concentrated in larger markets, particularly in these earliest stages of competitive local exchange services. The concentration of CLEC switches in larger markets, a natural outcome of the competitive process, indicates that realistic alternatives for ILEC unbundled switching will be available primarily in these markets.

Today, CLEC switch deployment is driven by the desire to service business customers, so a reasonable measure of market size is total business lines. A naïve model of switch deployment might be written as

$$N = \alpha_0 + \alpha_1 L \tag{1}$$

where N is the number of switches deployed and L the number of business lines in a market. The parameter α_1 measures the rate at which business lines produce CLEC switches. Equation (1) assumes that there is a linear relationship between switch deployment and business lines. It could be, however, that the relationship between business lines and switch deployment might differ between smaller and larger markets. Some smaller markets, for example, may be too small to support any CLEC switches.

To evaluate differences among market size and switch deployment, equation (1) could be re-specified as

$$N = \alpha_0 + \alpha_1 L + \alpha_2 (L - L^*) D + \varepsilon \tag{2}$$

where L^* is the number of business lines that distinguishes "large" markets from "small" markets, D is dummy variable that equals 1 for markets that have more lines than L^*.[1] Now, the parameter α_1 measures how changes in lines in small markets affect switch deployment, while $(\alpha_1 + \alpha_2)$ measures the relationship between lines and switches in larger markets (i.e., markets with more than L^* lines). Equation (2) will be estimated by ordinary least squares, so an econometric disturbance term, ε, is included in the expression.

Equation (2) is estimated using voice switch deployment data from Paradigm Research (*The 1999 CLEC Report*, 10th Edition). HAI and Associates, Inc provided business line data. All data was aggregated to the Metropolitan Statistical Areas (MSA) level. All variables are expressed as logarithms, and the equation is estimated using data on the 50 largest MSAs.[2] L^* was not chosen randomly, but by altering its value until the

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[1] For a discussion of piecewise regressions and spline functions, see R. S. Pindyck and D. L. Rubinfeld, *Econometric Models and Economic Forecasts*, 1991.

[2] Only 49 markets made the final sample, because one market had zero switches.

R^2 of the regression was maximized. This approach is equivalent to a maximum likelihood estimate of L^*. The results of the regression are summarized in Table A-1.

Table A-1. Regression Results

Coefficient	Estimate (t-stat)
α_0	11.44 (1.60)
α_1	-0.79 (1.40)
α_2	1.83 (2.65)*
Adj. R^2 = 0.36	F Stat = 14.41*
Observation = 49	RESET F = 0.29

* Statistically Significant at the 0.01 level.

The estimation approach indicates that the structural break in the line-switch relationship occurs at 375,000 lines (this is L^*). In markets smaller than 375,000 lines, the absence of a relationship between lines and switch deployment cannot be rejected (α_1 is not statistically significant). For markets larger than 375,000 lines, the relationship between lines and switch deployment is measured by ($\alpha_1 + \alpha_2$), which is a positive and statistically significant. The regression model indicates that, in fact, the economics of switch deployment larger markets is different than smaller markets. For this sample of 50 markets, the structural shift occurs at about the 30th largest market ranked by business lines.

Table 1: MSAs Ranked by Total Number of Business Lines

MSA	Total Business Line
New York, NY	2,154,598
Los Angeles, CA	2,149,360
Chicago, IL	2,068,118
Washington DC-MD-VA-WV	1,657,859
Boston-Worcester-Lawrence-Lowell-Brockton, MA-NH	1,355,657
Philadephia, PA-NJ	1,093,074
Detroit, MI	942,603
Houston, TX	894,297
Atlanta, GA	870,351
Orange Co., CA	824,436
Dallas, TX	778,741
Nassau-Suffolk, NY	679,898
San Diego, CA	655,764
Baltimore, MD	593,146
Minneapolis-St. Paul, MN-WI	573,013
Oakland, CA	570,010
San Francisco, CA	566,822
Newark, NJ	549,455
San Jose, CA	515,623
Pittsburgh, PA	490,080
St. Louis, MO-IL	488,152
Phoenix-Mesa, AZ	481,020
Miami, FL	476,819
Seattle-Bellevue-Everest, WA	475,940
Denver, CO	458,496
Cleveland-Lorain-Elyria, OH	451,697
Riverside-San Bernadino, CA	446,304
Bergen-Passaic, NJ	439,076
Tampa-St. Petersburg-Clearwater, FL	427,553
Sacramento, CA	384,361
New Haven-Bridgeport-Stanford-Waterbury-Danbury, CT	374,264
Indianapolis, IN	347,315
Norfolk-Virginia Beach-Newport News, VA-NC	344,402
Orlando, FL	339,109
Kansas City, MO-KS	336,381
Columbus, OH	323,708
Fort Worth-Arlington, TX	318,964
Ft. Lauderdale, FL	305,574
Buffalo-Niagara Falls, NY	303,118
Milwaukee, WI	296,952
Charlotte-Gestonia-Rock Hill, NC-SC	283,115
Portland-Vancouver OR-WA	274,125
Cincinnati, OH-KY-IN	263,466
Las Vegas, NV-AZ	259,237
San Antonio, TX	256,557
Middlesex-Somerset-Hunterdon, NJ	256,084

Austin-San Marcos, TX	239,683
Greensboro-Winston-Salem-High Point, NC	239,660
Hartford, CT	238,417
New Orleans, LA	236,929
West Palm Beach-Boca Raton, FL	226,732
Nashville, TN	225,660
Salt Lake City-Ogden, UT	220,897
Raleigh-Durham-Chapel Hill, NC	216,574
Rochester, NY	206,075
Grand Rapids-Muskegon-Holland, MI	194,364
Memphis, TN-AR-MS	194,330
Oklahoma City, OK	193,449
Jacksonville, FL	185,973
Providence-Warwick-Pewtucket, RI	172,621

Table 2: Partial List of Cities Outside the Largest 25 MSAs in Which ILEC Zone 1 Central Offices are Located

ILEC	City	MSA Pop (000)	Major County Pop (000)
Ameritech	Indianapolis	1,501	803
	Akron	682	532
	Columbus	1,480	1,017
	Dayton	945	561
Bell Atlantic	Newark, DE	556	475
	Wilmington, DE	556	475
	Salisbury, MD	too small to be listed	
	Princeton, NJ	too small to be listed	
	Hightstown, NJ	too small to be listed	
	Trenton, NJ	too small to be listed	
	Allentowrn, PA	614	298
	Mountainville, PA	614	298
	Bethlehem, PA	614	298
	Scranton, PA	622	318
	State College, PA	133	133
	Richmond, VA	943	244
	Roanoke, VA	229	94
	Charleston, WV	254	204
	Albany, NY	876	294
	Binghampton, NY	252	199
	Schenectady, NY	876	147
	Syracuse, NY	741	461
	Utica, NY	299	233
	Bangor, ME	143	143
	Portland, ME	251	251
	Providence, RI	905	574
	Burlington, VT	191	141
	White River Junction, VT too small to be listed		
SBC	Little Rock, ARK	552	350
	Wichita, KS	531	439
	Oklahoma City, OK	1,031	630
	Austin, TX	1,071	694
	Laredo, TX	183	183
	Fresno, CA	869	754
	Ventura, CA	726	726
U S West	did not distinguish between Zone 1 and Zone 2 locations.		

BellSouth	(tends to select all the central offices in a city, not just the central offices in the downtown business district of the city)		
	Birmingham, AL	900	659
	Charlotte, NC	1,350	613
	Greensboro, NC	1,153	382
	Memphis, TN	1,083	866
	Jacksonville, FL	1,035	733
	Jackson, MS	425	247
	Louisville, KY	993	671
	Montgomery, AL	319	218
	Nashville, TN	1,135	534
	New Orleans, LA	1,308	469
	Columbia, SC	504	304
GTE	Goleta (S Barbara) CA	390	390
	El Nido (Merced) CA	196	196
	Slater (Bkrsfld) CA	629	629
	Chino, CA	194	194
	Bloomington, IL	141	141
	Carbondale, IL	too small to be listed	
	Jacksonville, IL	too small to be listed	
	Jerseyville, IL	too small to be listed	
	Marion, IL	too small to be listed	
	Macomb, IL	too small to be listed	
	Norton, IL	too small to be listed	
	Durham, NC	1,050	200
	Broken Arrow, OK	too small to be listed	
	Erie, PA	279	279
	Johnstown, PA	238	157
	Oil City, PA	too small to be listed	
	York, PA	371	371
	College Station, TX	133	133
	Bryan, TX	133	133
	San Angelo, TX	103	103
	Sherman, TX	102	102
	Texarkana, TX	123	84
Sprint	South Fort Myers, FL	387	387
	Junction City, KS	too small to be listed	
	Jefferson City, MO	too small to be listed	
	Greenwood, SC	too small to be listed	
	Bristol, Kingsport, Johnson City, TN,	460	151
	Killeen, TX	300	222
	Charlottesville, VA	147	78